

1 I CLAIM:

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3 1. A method of minimizing oil consumption in a gas
4 turbine engine, by avoiding reliance on air intake into the
5 engine oil circuit for bearing chamber oil sealing
6 purposes, the engine having an oil circuit including:

7 at least one bearing supporting at least one engine
8 shaft at a support point along a shaft axis;

9 at least one bearing chamber enveloping each said
10 bearing and maintaining a volume of oil with an oil-air
11 interface in communication with a volume of air therein;
12 and

13 oil circulation means in flow communication with each
14 bearing chamber for supplying a flow of oil to a bearing
15 chamber inlet and for evacuating spent oil from an outlet
16 of the bearing chamber;

17 characterized in that, the method comprises:

18 sealing each bearing chamber with a hydropad seal
19 disposed in sealing relation between the shaft and bearing
20 chamber, the hydropad seal comprising an annular ring
21 mounted to the shaft and an annular pad mounted to the
22 chamber, the ring and pad having abutting seal surfaces;

23 rotating the ring during engine operation to cast oil
24 radially outwardly from said shaft axis toward an outer
25 periphery of the bearing chamber under centrifugal force;

1 collecting oil from the outer periphery of the bearing
2 chamber and directing oil flow to the bearing chamber
3 outlet.

4 2. A method according to claim 1 wherein the oil
5 circulation operates independently of an oil-air separation
6 function and an air venting function.

7 3. A method according to claim 1 wherein the abutting
8 sealing surfaces of the hydropad remain engaged in
9 frictional sealing relation below a lift off rotary speed.

10 4. A method according to claim 3 wherein the abutting
11 sealing surfaces of the hydropad disengage when rotary
12 speed exceeds the lift off rotary speed, the ring sealing
13 surface casting oil outwardly under centrifugal force to
14 impede oil passage through the hydropad seal.

15 5. A method according to claim 1 wherein cast oil is
16 collected from the outer periphery of the bearing chamber
17 using an oil scoop disposed on said periphery.

18 6. A gas turbine engine that reduces air intake into the
19 engine oil circuit for bearing chamber oil sealing
20 purposes, the engine having an oil circuit including:

21 at least one bearing supporting at least one engine
22 shaft at a support point along a shaft axis;

23 at least one bearing chamber enveloping each said
24 bearing and maintaining a volume of oil with an oil-air
25 interface in communication with a volume of air therein;
26 and

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1 oil circulation means in flow communication with each
2 bearing chamber for supplying a flow of oil to a bearing
3 chamber inlet and for evacuating spent oil from an outlet
4 of the bearing chamber;

5 characterized in that, the engine comprises:

6 a hydropad seal disposed in sealing relation between
7 the shaft and a bearing chamber, the hydropad seal
8 comprising an annular ring mounted to the shaft and an
9 annular pad mounted to the chamber, the ring and pad having
10 abutting seal surfaces;

11 turbine means mounted to the shaft for rotating the
12 ring during engine operation to cast oil radially outwardly
13 from said shaft axis toward an outer periphery of the
14 bearing chamber under centrifugal force; and

15 wherein the oil circulation means includes oil
16 scavenge means for collecting oil from the outer periphery
17 of the bearing chamber and directing oil flow to the
18 bearing chamber outlet.

19 7. An engine according to claim 6 wherein the oil
20 circulation means operate independently of an oil-air
21 separation function and an air venting function.

22 8. An engine according to claim 6 wherein the abutting
23 sealing surfaces of the hydropad remain engaged in
24 frictional sealing relation below a lift off rotary speed.

25 9. An engine according to claim 8 wherein the abutting
26 sealing surfaces of the hydropad disengage when rotary

1 speed exceeds the lift off rotary speed, wherein the ring
2 sealing surface casts oil outwardly under centrifugal force
3 to impede oil passage through the hydropad seal.

4 10. An engine according to claim 6 wherein the oil
5 scavenge means include an oil scoop disposed on the outer
6 periphery of the bearing chamber.

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